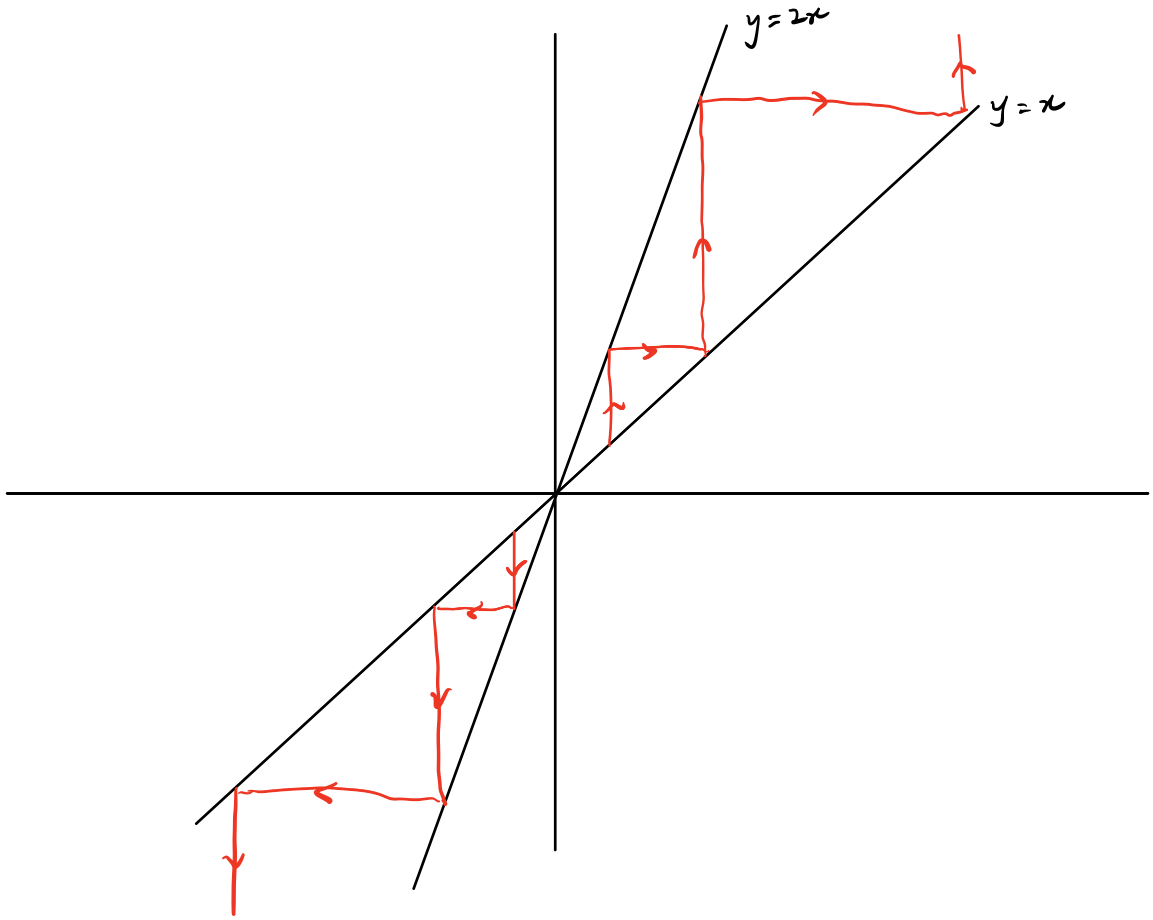
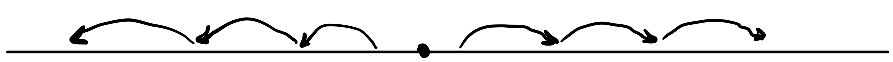


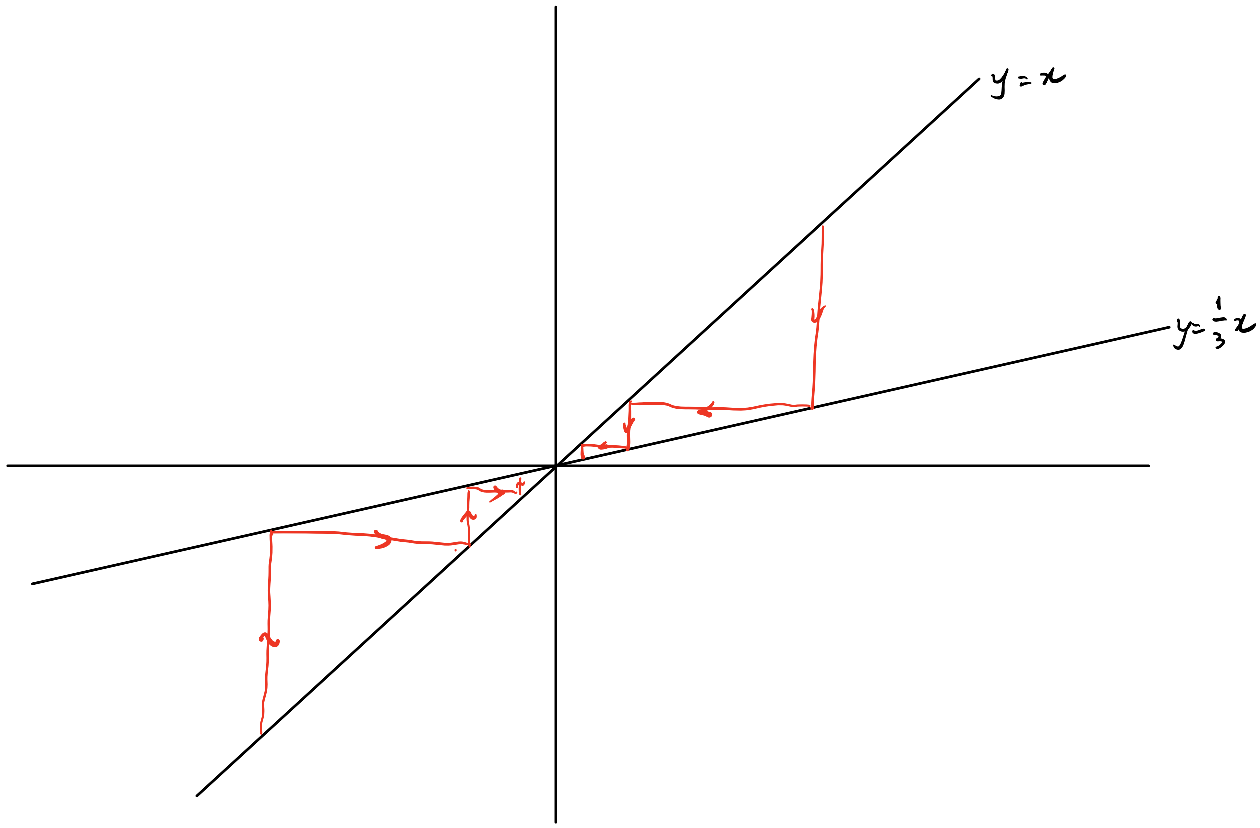


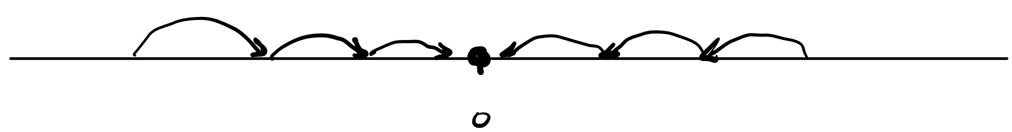
Summary

- $x_0 = 0$ is the only fixed point

- when $x_0 > 0$, $F^n(x_0)$ diverges to $+\infty$

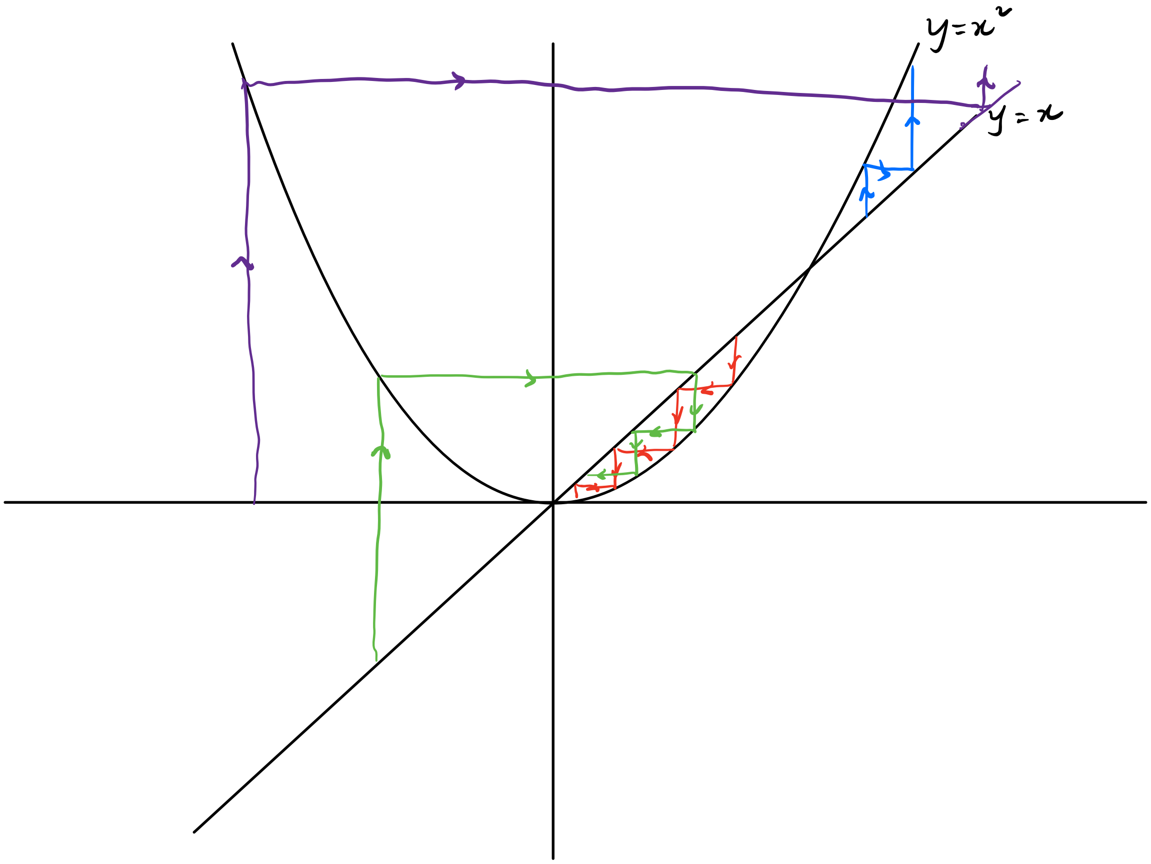
- when $x_0 < 0$, $F^n(x_0)$ diverges to $-\infty$

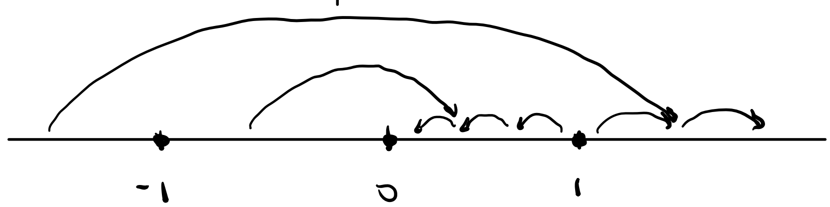




Summary

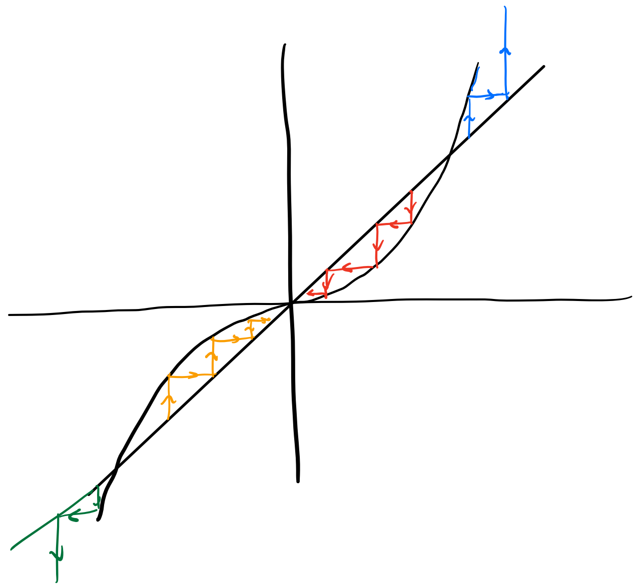
- $x_0 = 0$ is the only fixed point
- for any $x_0 \neq 0$, $F^n(x_0)$ converges to 0 as $n \to \infty$.





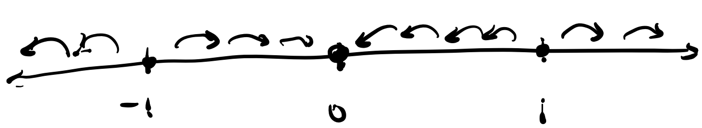
Summary

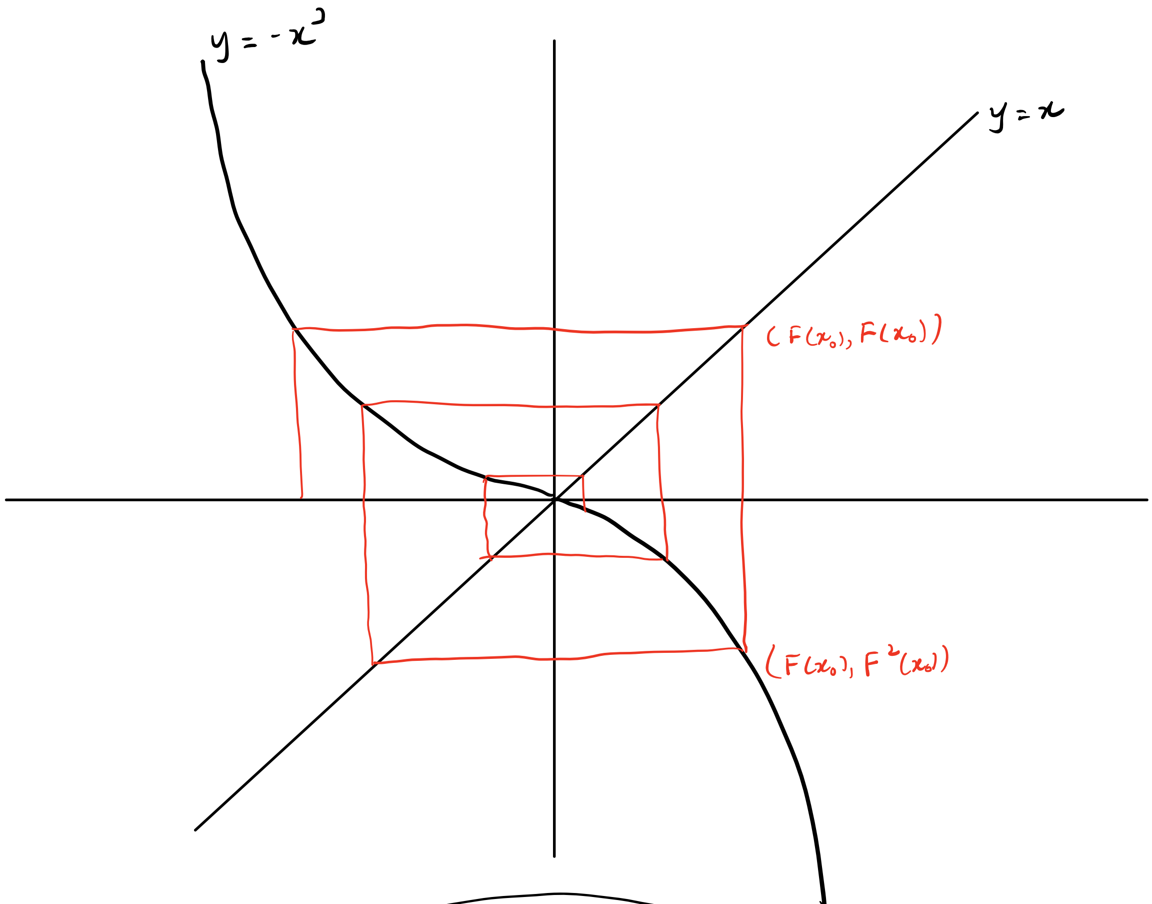
- $x_0=0$, $x_0=1$ are fixed points
- $x_0=-1$ is eventually fixed
- when $-1<x_0<1$, $F^n(x_0)$ converges to 1
- when $|x_0|>1$, $F^n(x_0)$ diverges to $+\infty$.

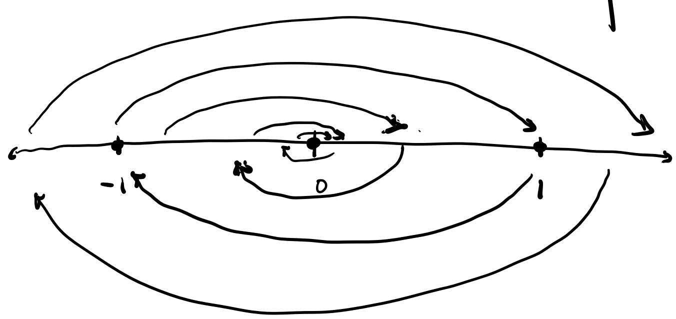


Summary

- $x_0 = -1, 0, 1$ are fixed points
- if $-1 < x_0 < 1$, $F^n(x_0)$ converges to 0
- if $x_0 > 1$, $F^n(x_0)$ diverges to $+\infty$
- if $x_0 < -1$, $F^n(x_0)$ diverges to $-\infty$







Fixed points

$$-x^3 = x$$

$$x^3 + x = 0$$

$$x(x^2+1) = 0$$

$$x = 0$$

What happens when $x_0 = 1$

$$x_1 = F(x_0) = F(1) = -1^3 = -1$$

$$x_2 = F(x_1) = F(-1) = -(-1)^3 = 1 = x_0$$

So $x_0 = 1$ is 2-periodic, and so is -1.

Summary

- $x_0 = 0$ is the only fixed point
- $x_0 = \pm 1$ are 2-periodic
- when $-1 < x_0 < 1$, $F^n(x_0)$ converges to 0
- when $|x_0| > 1$, $F^n(x_0)$ diverges to $\pm\infty$.

(oscillating between $\pm\infty$)